

AMENDMENTS TO THE CLAIMS

The following listing of claims will replace all prior versions, and listings, of claims in the application.

1. **(Currently Amended)** An axial flow rotary blood pump including an impeller adapted to be magnetically rotated within a housing by the interaction of magnets disposed on or in the impeller and stators disposed on or in the housing, characterized in that said impeller includes at least one support ring supporting a plurality of blades, and a hydrodynamic bearing that operates at least axially and radially in respect of an axis of rotation of the impeller wherein the impeller includes a central shaft, a support ring, and a plurality of spaced apart blades extending between the support ring and the central shaft, wherein the support ring forms at least two surfaces extending at an angle to an axis of rotation for the impeller to form hydrodynamic bearing surfaces and a channel disposed between the at least two surfaces.
2. **(Currently Amended)** The axial flow rotary blood pump of claim 1, wherein each of the at least two surfaces said hydrodynamic bearing exclusively suspends said impeller within a cavity extends, in a radial direction, between a leading edge and a trailing edge, and the leading edge is lower than the trailing edge.
3. **(Currently Amended)** The axial flow rotary blood pump of claim [[1]] 2, wherein said hydrodynamic bearing is formed by angular pads the leading edge is 50 μ m lower than the trailing edge.
4. **(Currently Amended)** The axial flow rotary blood pump of claim 1, wherein each of the at least two surfaces extend to a leading edge formed so that a first portion of the leading edge proximal an upper face of the support ring is radially offset, with respect to the axis of rotation, from a second portion of the leading edge proximal a lower face of the support ring wherein said support ring includes the hydrodynamic bearing.

5. (Currently Amended) The axial flow rotary blood pump of claim 1, wherein said support ring includes the magnets the magnets disposed on or in the impeller include an upper set of magnets and a lower set of magnets radially offset from the upper set of magnets.

6. (Currently Amended) The axial flow rotary blood pump of claim 1, wherein said plurality of blades extend from the support ring towards the centre of the housing the support ring forms four surfaces extending at the angle, wherein the four surfaces oppose walls of the housing to thereby form a space for a hydrodynamic bearing.

7. (Currently Amended) An axial flow rotary blood pump including an impeller adapted to be magnetically rotated within a housing by the interaction of magnets disposed on or in the impeller and stators disposed on or in the housing, characterized in that the impeller includes at least one support ring supporting a plurality of blades, and a hydrodynamic bearing that operates at least axially and radially in respect of an axis of rotation of the impeller.

The axial flow rotary blood pump of claim 1, wherein said the blades have a decreasing pitch to straighten blood flowing out of the housing.

8. (Currently Amended) An axial flow rotary blood pump including an impeller adapted to be magnetically rotated within a housing by the interaction of magnets disposed on or in the impeller and stators disposed on or in the housing, characterized in that the impeller includes at least one support ring supporting a plurality of blades, and a hydrodynamic bearing that operates at least axially and radially in respect of an axis of rotation of the impeller.

The axial flow rotary blood pump of claim 1, wherein said the housing is spider-less and seal-less.

9. (Currently Amended) The axial flow rotary blood pump of claim 1, wherein a gap is formed between the channel and a surface of the housing at an outlet end of the impeller to allow blood to flow from the outlet end of the impeller to an input end thereof so that the wherein said impeller, when in use, experiences retrograde blood flow around its periphery.

10. (Cancelled)

11. (Currently Amended) An axial flow ~~few~~ rotary blood pump including: an impeller adapted to be magnetically rotated within a housing by the interaction of magnets disposed on or in the impeller and stators disposed on or in the housing, wherein said the impeller includes at least one hydrodynamic thrust bearing and blades having a decreasing pitch to straighten blood flowing out of the housing wherein said impeller includes at least one channel formed in the outer surface of the impeller to propel blood through the housing, when impeller is rotated within the housing.

12-15. (Canceled)

16. (New) The axial flow rotary blood pump of claim 11, wherein the impeller further includes a support ring forming at least two surfaces extending at an angle to an axis of rotation for the impeller to form hydrodynamic bearing surfaces and a channel disposed between the at least two surfaces.

17. (New) The axial flow rotary blood pump of claim 16, wherein each of the at least two surfaces extends, in a radial direction, between a leading edge and a trailing edge, wherein the leading edge is lower than the trailing edge.

18. (New) The axial flow rotary blood pump of claim 16, wherein each of the at least two surfaces extend to a leading edge formed so that a first portion of the leading edge proximal an upper face of the support ring is radially offset, with respect to the axis of rotation, from a second portion of the leading edge proximal a lower face of the support ring.

19. (New) The axial flow rotary blood pump of claim 16, wherein the magnets disposed on or in the impeller include an upper set of magnets and a lower set of magnets radially offset from the upper set of magnets.

20. (New) The axial flow rotary blood pump of claim 16, wherein the support ring forms four surfaces extending at the angle and opposing walls of the housing.

21. (New) The axial flow rotary blood pump of claim 11, wherein the blades form a screw thread configuration about a central shaft of the impeller.

22. (New) The axial flow rotary blood pump of claim 21, wherein downstream of the impeller the axial flow rotary blood pump is devoid of flow straighteners.

23. (New) The axial flow rotary blood pump of claim 11, wherein an outlet for the axial flow rotary blood pump is configured so that a net flow direction at the outlet is substantially parallel to an axis of rotation for the impeller.

24. (New) The axial flow rotary blood pump of claim 1, wherein the stators are axially offset from the magnets.

25. (New) The axial flow rotary blood pump of claim 11, wherein the stators are axially offset from the magnets.